Land Mine Primer

The widespread use of landmines on today's battlefields results from a combination of mass production, plastic mines, improved battlefield delivery systems, and development of sophisticated fuzing. Advances in mass-production techniques and the associated reduction in per-item cost along with its simplicity of manufacture and automated production make landmines extremely attractive for terrain denial. Another technological improvement affecting landmines is the widespread use of plastic. Metal detectors are ineffective for locating plastic-cased mines unless the manufacture intentionally places a mass of metal in the mine. Remotely delivered mines have expanded capability for changing the tempo of battle. Development of various fuze arming and triggering options have increased mine usefulness in warfare.

1. Types of Minefields. The five basic types of OPFOR minefields are antitank (AT), antipersonnel (AP), mixed, decoy, and antilanding. AT minefields are the primary type of OPFOR engineer obstacle and serve to destroy or disable armored vehicles. They are primarily established in belts consisting of multiple rows on avenues that are favorable for tanks in front of the forward edge and on the flanks. Where difficult terrain is available, minefield belts will be tied into terrain obstacles to reduce the mine requirement. The OPFOR sets up conventional AP minefields on the forward edge of friendly defensive positions, in front of AT minefields, or along dismounted avenues of approach. Mixed minefields consist of both AP and AT mines. Decoy minefields are a significant form of deception to slow movement or deceive as to true unit locations. Antilanding minefields prevent landings by amphibious, airborne, or heliborne assault forces.

Minefields can also be categorized by their technical method of activation—uncontrolled, controlled, and intelligent minefields. Controlled minefields consist of landmines with electronic switches giving the operator (controller) control over the operational status of the minefield. The operator can change the status of the landmines either by a direct hardwire link or by radio. An entire minefield can be emplaced and turned on or off, as necessary to best support friendly operations. On a smaller scale, select passages in a conventional minefield can contain controllable landmines, allowing for the option of clearing safe lanes for friendly use. The addition of selectable anti-removal and self-destruct features to controlled mines enhances flexibility and overall effectiveness.

Intelligent minefields are far-term concepts, with no foreign systems projected for fielding prior to 2008. They are still in the developmental stage and will have all the advantages of controlled landmines but also will use two-way communications. They will be composed of "wide area coverage" mines.

2. Types of Mines. Mines may be AT/anti-vehicle, AP, antihelicopter, or area mines. They may also be defined by the manner in which they are emplaced such as scatterable (remote), or side-attack (generally AT or anti-vehicle) or their area coverage. As noted earlier for minefields, the OPFOR makes distinctions between controlled mines (command-operated by hard wire or radio linkage) and uncontrolled mines.

a. Antitank. Conventional antitank mines, such as the TM-62 AT mine, are those that are emplaced either by hand or by mechanical means. These will continue to be the primary landmine threat throughout the foreseeable future. They are readily available to armies and insurgency groups worldwide and are cheap and effective. These mines are normally buried just below the surface of the ground but can be surface laid or buried with up to 30 cm of cover.

Antitank mines can vary in size from as small as 1.4 kg for a scatterable mine (PTM-1S) to over 20 kg for a side attack mine (TM-83). The category of antitank mines includes side-attack and anti-vehicle mines.

(1). Side-attack. Commonly called “off-route mines”, side-attack mines are an integral part of the adaptive battlefield and date back to the LGM trip-wire AT mines of the Vietnam War era. Today there are at least 18 different side-attack mines in use by 22 countries. Ten more side-attack mines are under development. Within the next few years these weapons will have proliferated to every combat environment.

Side-attack mines are autonomous weapons that attack vehicles from the side as the vehicles pass by. Current developments in side-attack landmines use mature technology from other weapon programs. For example, a shoulder-fired AT weapon placed on a tripod and fitted with an IR sensor can kill moving targets up to 100 meters away. Current warhead technology in these weapons can allow penetration of up to 950 mm of rolled homogeneous armor. Since side-attack landmines have increased areas of coverage, the number required to hinder mobility of enemy forces is greatly reduced. Uses for these landmines include harassment throughout the area of operation and reinforcement of conventional minefields to make "cleared" lanes unsafe. SOF and security patrols can also use these mines to economically cover multiple avenues of approach, alert on enemy encroachments, and trigger time-sensitive kill zones.

(2). Anti-vehicle. Many smaller antitank mines, or larger antipersonnel mines, have been developed (or modified) to severely damage or destroy vehicles other than tanks with a few pound of high explosives or fragmentation. These may be either trucks or lightly armored combat support vehicles such as BTRs.

b. Antipersonnel. On the battlefield, the modern AP mine is used to:

- Inflict personnel casualties.
- Hinder soldiers in clearing AT minefields.
- Establish defensive positions.
- Deny access to terrain.

Antipersonnel landmines injure by either blast or fragmentation. The small antipersonnel mine contains no more than a pound (usually only a few ounces) of high explosive. Blast injures by the force of the charge. The loss of a foot or a leg is the common result. Fragmentation mines contain hundreds to thousands of pellets. Plastic-cased landmines pepper their victims with small particles of plastic that are not detectable with x-rays, making complete cleansing of wounds extremely difficult and increasing the risk of infection and amputation.

c. Antihelicopter. The modern attack helicopter, with increasing agility and weapons payload, is able to bring enormous firepower to bear on enemy forces. To counter this threat, a new type of mine—the antihelicopter mine—is being developed. By borrowing technologies from the side-attack and wide-area landmines, antihelicopter mines may make use of acoustic fuzing to locate and target potential low-flying targets at significant distances. Their multiplefragment warheads are more than capable of destroying light-skinned, nonarmored targets at closer ranges.

A simple antihelicopter mine can be assembled from an acoustic sensor, a triggering IR sensor, and a large directional fragmentation mine. More advanced mines use a fairly sophisticated data processing system to track the helicopter, aim the ground launch platform, and guide fire the kill mechanism toward the target. As the helicopter nears the mines, the acoustic sensor activates or cues an IR or MMW sensor. This second sensor initiates the mine when the helicopter enters the lethal zone of the mine. A typical large fragmentation warhead is sufficient to damage soft targets, such as aircraft. Alternate warhead designs include high-explosive warheads and single or multiple explosively formed penetrators.

d. Area Coverage. The terms “area” and “wide area” mines are often confusing and misleading. Mines classified as area mines range from antipersonnel “bouncing Betty” mines to side-attack mines, directional fragmentation mines “claymores”, and possibly antihelicopter mines. Wide area coverage mines with sophisticated fuzing and possibly a limited communications capability are weapons of the future and have not been fielded.

3. Emplacement or Delivery Methods. In the past landmines generally were placed manually one at a time. Mass mine delivery and distribution systems permit the rapid placement of large quantities of mines. Landmine emplacement vehicles are designed to automatically arm and bury a landmine every 3-10 meters. Landmines also may be placed with artillery, rockets, or aircraft at a rate of hundreds, even thousands, of mines per minutes.

Emplacement means may be manual, mechanical, or remote. Manual emplacement is not possible when there is little time or during high-speed maneuver operations. Therefore, mechanical and remote means are more prevalent.

a. Manual. The OPFOR manually emplaces minefields when—

- There is no contact with the enemy.
- Mechanical minelayers are unavailable.
- It is inadvisable to use mechanical minelayer because of terrain restrictions.

b. Mechanical. OPFOR engineers rely extensively on mechanized minelayers. These can bury or surface-lay AT mines. The layout of mechanically emplaced minefields is the same as those emplaced by hand. Mines can also be emplaced by helicopters or vehicles with the use of chutes (slides). Mine chutes can also be used to assist manual burial emplacement or to surface-lay mines.

c. Scatterable Mines. The US calls them "scatterable mines", other countries call them "remotely-delivered". Whatever you chose to call them they are landmines, laid without regard to classical patterns, which are designed to be delivered by aircraft, tube artillery, multiple rocket launchers, missiles, ground vehicles, or they can be hand-thrown. Scatterable mines are not a standard item except in well-equipped armies of the world. While the number of countries possessing scatterable mines continue to increase, there will continue to be many areas of the world where scatterable mines are not a threat through the far term.

Minefield emplacement is progressing from manually and mechanically emplaced minefields to the more flexible and dynamic remotely, scatterable minefield. The ability to remotely deliver mines allows a rapid response with thousands of landmines at any point on the battlefield. Since many scatterable landmines feature self-destruct and antidisturbance fuzing, they are well suited for operations that deny terrain for a specific period. After the allotted time has expired, the terrain can once again be used by friendly forces. Scatterable mines may be delivered by the following methods.

(1) Artillery. Multiple rocket launchers are the primary means of remote minelaying. The principal advantage of MRL mine delivery is its ability to quickly emplace large minefields in a single volley, while minimizing exposure to enemy targeting and weapon systems. Both AP and AT mines can be delivered by artillery (which may include cannon and mortar rounds).

(2) Ground Vehicles. Within recent years the trend has been to mount scatterable-mine dispensers on ground vehicles. Both AP and AT mines can be launched from ground vehicles. This also gives the engineers the ability to re-seed or reinforce an obstacle without entering the minefield itself.

(3) Infantry. Lower level OPFOR infantry units may employ man-portable remote mine dispensers. These man-portable dispensers, weighing only a few pounds, are ideal for installing small, defensive, AP or AT minefields. Infantry-fired ground dispensers allow low-level units to remotely emplace minefields to protect their fighting positions, flanks, and boundaries between units, or to cover firing lines and gaps in combat formations. They can quickly close breaches in existing protective minefields and increase the density of mines on armor avenues of approach.

(4) Aerial. Both AT and AP minefields can be laid using aerial minelaying systems. Bombers and fighter-bombers can lay remotely delivered minefields in the operational depths. Ground-attack aircraft lay these minefields in the enemy's tactical depths.

Helicopter minelaying systems are used to emplace small mine belts or large barrier minefields in the execution of army or division offensive or defensive maneuver plans. This type of aerial minelaying is normally conducted over friendly territory—along flanks or in rear areas. When supporting an airborne or air assault landing, helicopters may lay mines on enemy territory. Helicopter mine chutes are a tool available to even low-technology helicopter forces for installation on a variety of helicopters by low echelon maintenance units and rapidly dispensing conventional anti-tank mines in areas inaccessible to even rapidly moving ground vehicles.

Placement of a limited number of side-attack or conventional AT/AP mines along likely movement routes allows the OPFOR to harrass traffic, slow movement rates, cause casualties, and affect enemy morale.

4. Fuzes. Some types of fuzes, such as pressure fuzes, are used in both AT and AP mines while other fuzes tend to be linked more to specific types of mines. For example, acoustic sensors are generally used with antihelicopter and advanced off-route mines while magnetic, tilt-rod, or seismic fuzes are used with AT mines. Most AT mines are detonated by the pressure of a vehicle driving over a buried mine or by the movement of a tilt rod attached to the mine. Pressure and tilt-rod AT mine fuzes are being replaced or complemented by mines with magnetic, optical, seismic, and acoustic influence mines.

Some mines have a second fuze well to facilitate the installation of a anti-handling fuze. Conventional antihandling devices and target-sensing fuzes have evolved into sophisticated booby traps, which virtually assure grievous injury or death to the deminer. Some landmines may be detonated by metal detectors; others explode when their fuzes detect light when lifted from the ground. One version of the “Bouncing Betty” is activated by an array of seismic detectors.

Other mines, for example the US M18A1, will accommodate a variety of fuzes, including tripwire and command detonation. Other mines, especially antihelicopter mines use a combination of sensors/fuzes to acquire the helicopter and initiate the mine when the helicopter enters the lethal zone.

a. Pressure. The pressure fuze is the most common type of fuzes for both AT and AP mines. It may require only a few ounces pressure to active the mine or as much as several hundred pounds.

b. Trip Wire. Also called pressure release, these fuzes may be attached to a thin wire stretched across a path or route. When the victim or vehicle passes and breaks the wire, the mine is detonated. Trip wires are used mainly with AP and side-attack mines.

c. Magnetic. Most armored vehicles contain a large quantity of steel and therefore create large magnetic disturbances that signal their presence to a magnetic influence fuzed landmine.

d. Optical. An optical fuze, using a small infrared or ultra-violet transmitting diode on a surface-placed landmine, sends a detonation signal with it senses light reflecting from the hull of a tank.

e. Radar. A small micro-electronic radar can sense the underside of a tank by the magnitude and location of the radar reflection.

f. Seismic. Mines can be equipped with sensors that detect the vibrations caused by the weight and track movement of tanks or by the noise they make.

g. Acoustic. When a system approaches, antihelicopter or advanced off-route mines use an acoustic sensor to activate or cue an IR, seismic, or MMW sensor.

h. Infrared. IR sensors are generally used against vehicles, ground and aerial.

Mines the US soldier is "most likely to encounter" on the adaptive battlefield

Name	Country of Manufacture	Number of User Countries	Emplacement Method	Armor Penetration (mm)/ Kill Mechanism	Effective Range (meter)	Detectability/ Composition	Anti-Handling	Fuze Type/ Self Neutralize	Explosive Type & Weight/Total Weight (kg)	Comment
Anti-Tank Mines										
Scatterable										
PTM-3	FSU	12+	remote-surface: UMZ, helicopter, PKM portable	70 mm: penetrates tank belly & destroys running gear		visual mine detectors cause detonation plastic	yes	proximity, magnetic self-destruct: yes-16 to 24 hrs	TG-40: 1.8 kg Total: 5 kg	
PTM-1S/ PGMDM	FSU	17+	remote-surface: UMZ, MRL, aircraft, PKM portable	track breaker on contact/ blast	1	visual plastic	no	contact, pressure neutralize: yes- 0 to 24 hrs	PVV-12S liquid plastic: 1.4 kg	similar to German AT-1
Manual, Mechanical, and Chute Emplaced										
TM-62M/ P/B/D	FSU Poland Bulgaria	30+	manual mechanical chute	27 RHAE blast	1	varies: M: metal-easy P: plastic B: caseless D: wood	Not built in	pressure (200 kg) magnetic seismic	Trotyl, RDX & aluminum/7 kg Total: 8.5 kg	
TM-57	FSU Bulgaria China Iraq	29+	manual mechanical chute	blast	1	easy sheet metal	yes	pressure (00/2.5/.5-6 kg) delay-armed, tilt rod, pull (booby trap) neutralize: no	TNT or TGA 60/24/16: 6.0 kg Total: 8.47 kg	
TM-46/ TMN-46	FSU Germany Bulgaria Egypt (M/71) Israel (No. 6)	28+	manual mechanical	blast	1	easy sheet metal	TMN-46 yes	pressure (180/132 kg), tilt rod neutralize: no	TNT, amatol/5.7 kg Total: 2.9 kg	
PT-Mi-Ba-III	Czech	17 + terrorist groups	manual mechanical chute	blast defeats known belly armor	1	plastic/bakelite (metal in fuze only-2.9 gr)	yes with RO-4 fuze	pressure (200 kg) self-destruct or neutral: no	TNT/7.2 kg Total: 9.9	
Mk 7	United Kingdom	16+	manual	blast	1	easy metal	yes	pressure (150 kg), tilt rod available	TNT/8.9 kg Total: 13.6	
TMD-B	FSU Namibia	16+	manual	blast	1	difficult with hand held detectors - wood	possible	pressure (200-500 kg) self-destruct or neutral: no	TNT/9.0 kg Total: 9.7	
TMA-3	Former Yugoslavia	13	manual mechanical	blast	1	very difficult with hand held detectors plastic coating	yes	pressure (180 kg) self-destruct or neutral: no	cast TNT/6.5 Total: 7.0	

Anti-Tank Mines continued

Name	Country of Manufacture	Number of User Countries	Emplacement Method	Armor Penetration (mm)/ Kill Mechanism	Effective Range (m)	Detectability/ Composition	Anti-Handling	Fuze Type/ Self Neutralize	Explosive Type & Weight/Total Weight (kg)	Comment
M19	US Chile Iran South Korea Turkey	13	manual	blast	1	difficult with hand held detectors plastic	yes	pressure (182 kg)	COMP B/9.53 kg Total: 12.56	
TMK-2	FSU	13+	manual	250 RHAE belly attack plate charge	1	easy metal	possible	tilt rod (8-12 kg) self-destruct or neutral: no	TG-50, TNT Total: 12.5	
PRB M3/ A	Belgium	12	manual	blast	1	very difficult with hand held detec-tors plastic	yes	pressure (250 kg)	RDX/TNT 6.5 Total: 6.8	

Side-Attack (Antitank and Anti-vehicle) Mines

Name	Country of Manufacture	Number of User Countries	Emplacement Method	Armor Penetration (mm)/ Kill Mechanism	Effective Range (meter)	Detectability/ Composition	Anti-Handling	Fuze Type/ Self Neutralize	Explosive Type & Weight/Total Weight (kg)	Comment
TM-83	FSU	13+	manual	100 RHAE EFP	50	visual case metal	possible	IR & seismic, or breakwire	explosive 9.6 Total: 20.4 kg	
LMG	FSU	13+	manual	rocket propelled shaped-charge	27	visual metal	no	Tension (1 kg), tripwire neutralize: no	TNT: 3.2 kg Total: 10 kg	
Panzer-faust	Germany	1	manual	700 rocket propelled shaped-charge	150	visual metal	no	IR & acoustic, seismic, breakwire		SIRA sen-sor package
MIACHAF F1	France UK (L14A1) Netherlands (NR 29)	4+	manual	70 RHAE @ 40 m shaped-charge	80	visual metal	no	breakwire, command, IR influence neutralize: no	Hexolite: 7 kg Total: 12 kg	
PARM 1 (DM-12)	Austria Germany UK Sweden Finland	5+	manual	600 rocket propelled shaped-charge	40	visual metal	no	neutralize: 20, 40, 60 days	Total: 10 kg	
PK Mi-PK	Czech	1+	manual	50 RHAE 5-EFPs	30	visual metal	possible	contact wire	explosive: 5.5 Total: 12	

Anti-Personnel Mines

Name	Country of Manufacture	Number of User Countries	Emplacement Method	Kill Mechanism	Effective Range (m)	Detectability/ Composition	Anti-Handling	Fuze Type/ Self Neutralize	Explosive Type & Weight/Total Weight (kg)	Comments
Scatterable										
PFM-1S	FSU	12+	remote-surface (UMZ, MRL, helicopter, PKM portable)	blast	1	visual plastic	no	pressure (5 kg) Self-destruct: 85% over 40 hr	liquid plastic-VS-6D: 40 g Total: 70 g	copy of US BLU-43B
POM-1S	FSU	12+	remote-surface (UMZ, helicopter, PKM portable)	fragmentation	4	visual	yes	tripwires, Self-destruct	100 g Total: 750 g	copy of US BLU-42B
POM-2S	FSU	12+	remote-surface (UMZ, helicopter, PKM portable)	fragmentation	16	visual, readily	no	tripwires (.2 kg) Self-destruct: 4 to 100 hr	TNT: .14 kg Total: 1.6 kg	
Manual, Mechanical, and Chute Emplaced										
PMN	FSU China Iraq	32+	manual chute	blast	1	readily-plastic case metal in fuze & cover	cannot be disarmed/	pressure plate-very sensitive (8-25 kg) self-neutralize: no	TNT: 237 g Total: .55 kg	most common AP mine
MON 100	FSU Bulgaria	27+	manual	directional fragmentation 400 pieces	100=width of kill zone @ 100 m= 6.5-9.5	metal case	possible but not likely	electric command, tension-release self-neutralize: no	TNT: 2 kg Total: 5 kg	also effective against lightly armored vehicles
OZM-4	FSU	26+	manual	bounding fragmentation (.6-.8 m above ground)	15	readily detectable case cast iron	possible	tripwire (2-5 kg), electrical, pressure, tension release self-neutralize: no	Total: 5 kg	
MON 200	FSU Bulgaria	25+	manual	directional fragmentation 900 pieces	200=width of kill zone @ 200 m= 10.5-14.5	visual metal case	possible but not likely	electrical, self-neutralize: no	TNT: 12 kg Total: 25 kg	also effective against lightly armored vehicles
PMD-6	FSU Namibia Serbia	24+	manual	blast	1	detectable wood metal in fuze	possible	pressure, tripwire (1 kg) self-neutralize: no	TNT: 200 g Total: .4 kg	
MON 50	FSU	23+	manual	directional fragmentation 485 pieces	width of kill zone @ 50 m=45	visual plastic case	possible	electric command, tripwire, tension, tension release self-neutralize: no	RDX: 700 g Total: 2 kg	copy of US M18A1 claymore

Antipersonnel Mines continued

Name	Country of Manufacture	Number of User Countries	Emplacement Method	Kill Mechanism	Effective Range (meter)	Detectability/ Composition	Anti-Handling	Fuze Type/ Self Neutralize	Explosive Type & Weight/Total Weight (kg)	Comments
POMZ-2M	FSU China (Type 59) North Korea Germany	22+	stake mine manual	fragmentation	4	visual, detector cast iron	possible	tripwire (1 kg force)	TNT: 75 g Total: 1.77 kg	
M18A1/ Claymore	US South Korea (K440) Pakistan (P5 Mark I) Iran Chile South Africa (Shrapnel mine No. 2) FSU (MON-50)	22+	manual	directional steel fragments	50	visual plastic case	possible	electric command, tripwire, tension, tension release	C4: 680 g Total: 1.60 kg	
M14	US India (M-14) Vietnam (MN-79 & MD 82B)	20+	manual	blast	1 contact	very difficult with hand-held detector plastic body (only metal is steel striker tip)	possible	pressure (9-16 kg)	TNT: 29 g Total: .099 kg	

Antihelicopter

Name	Country of Manufacture	Number of User Countries	Emplacement Method	Armor Penetration (mm)/ Kill Mechanism	Effective Range (meter) Maximum /Minimum	Detectability/ Composition	Target Velocity (m/s)	Fuze Type/	Warhead Type/Total Weight (kg)	Status
AHM-200	Bulgaria	1	manual	10 @ 100 m	max 200	visual		combined acoustic & Doppler SHF	Total weight: 35 kg	in production
HELKIR	Austria	1	manual	6 @ 50 m 2 @ 150 m		visual		dual acoustic & IR	Total weight: 43 kg	in production
TEMP-20	Russia	0	manual		detection 1,000 max 200	visual	100	dual acoustic & IR	Total weight: 12 kg	development
AHM	UK	0	manual remote		200/50	visual		dual acoustic & IR	multiple EFP	development

Russian Antitank Mine TM-62M/P/B/D

SYSTEM

Alternative Designations: None
Date of Introduction: 1960
Proliferation: Over 30 countries
Description:
Shape: Circular
Color: Olive Green
Case Material: (see VARIANTS)
Length (mm): 110
Height (mm): 101.8
Diameter (mm): 320
Total Weight (kg): 8.5

DETECTABILITY

Ready: Varies. The TM-62M (metal case) is readily detectable. Other variants are much more difficult. Of the TM-62 series antitank mines and fuzes, the TM-62P (plastic) is the most difficult to detect.

EXPLOSIVE COMPOSITION

Type: Trotyl, RDX and aluminum power
Weight: 7.5 to 8.3
Booster: Yes
Type: Pentryt
Weight (gr): 0.75

FUZE

Types: Pressure, seismic, magnetic
Safety Device: Delay arming, transport clip

Name: MVCh-62 (most common)
Type: Pressure
Actuation Force (kg): 200 /150 to 550
Resistant to Explosive Neutralization: Yes

Name: VM-62Z
Type: Seismic

Name: MVZ-62
Type: INA

Name: MVN-62
Type: INA

Name: MVN-80
Type: Proximity

Name: MVP-62
Type: Proximity

PERFORMANCE

Armor Penetration (mm): 27
Effect: Blast
Effective Range (m): 1
Emplacement Method: (see NOTES)
Manual
Mechanical
Chute
Burial Depth:
Maximum: 20
Minimum: None
Techniques of Employment: (see NOTES)
Controllable (remotely detonated): Yes, may use the Russian UMP-2 Controlled AT Minefield Set
Antihandling Device: Possible, however, no secondary fuze well or AD features. A special AD (MS-3) is used under AT mines.
Self-Destruct: No
Detonation Height: N/A
Underwater Emplacement: Limited duration capabilities when used underwater.

DELIVERY PLATFORMS (examples)

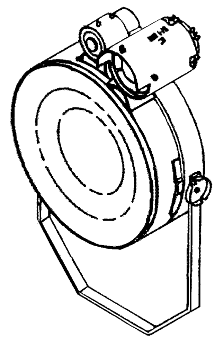
Tracked minelaying vehicle GMZ/GMZ-2/3
Towed mechanical minelayer PMR-3 and PMZ-4
Helicopter (with VMP-2 minelayer)

VARIANTS

TM-62M: Metallic case
TM-62P: Plastic case
TM-62B: Caseless
TM-62D: Wooden

NOTES
TM-62 mines can be emplaced in integrated explosive barriers or in homogeneous minefields. They may be employed singly or in groups as part of an explosive antitank barrier. TM-62 mines are placed in accordance with former Soviet doctrine, which dictates a normal density of one mine per meter of front.

Russian Side-attack Antitank Mine TM-83



SYSTEM

Alternative Designations: None
Date of Introduction: INA
Proliferation: At least 13 countries
Description:
Shape: Cylinder
Color: Olive green
Case Material: Metal
Length (mm): INA
Height (mm): 400
Diameter (mm): 250
Total Weight (kg): 20.4

DETECTABILITY

Ready: Visual

EXPLOSIVE COMPOSITION

Type: TG40/60
Weight (kg): 9.6
Booster: INA

PERFORMANCE

Armor Penetration (mm): 100
Effect: EFP, side-attack
Effective Range (m): 50
Emplacement Method: Manual
Controllable (remotely detonated): Yes, (100-m cable)
Antihandling Device: Possible
Self Destruct: 30 days

VARIANTS
None

FUZE

Types: 2-color IR sensor , seismic, or MVZ-7 breakwire
Number of Fuze Wells: 1
Actuation Force (kg): N/A
Resistant to Explosive Neutralization: Yes

NOTES
The TM-83 is a high-explosive antitank mine. It is basically a plate charge mounted on a stand. The mine uses seismic sensors to identify approaching targets and to turn on the dual IR sensor. When a valid target passes into the field of view of the sensor, the warhead is fired. The plate is formed into a slug which is propelled by the explosive, destroying the target. The seismic sensor is stored on the back of the mine and is connected by an electronic cable. It can also be fired electronically. The mine may be mounted on a tripod, the storage box, or tree, etc.

Austrian Antihelicopter Mine HELKIR

SYSTEM

Alternative Designations: None
Date of Introduction: In current production
Proliferation: At least 1
Description:
Shape: Rectangular
Color: Green
Case Material: Metal
Length (mm): INA
Height (mm): INA
Diameter (mm): INA
Total Weight (kg): 43

DETECTABILITY

Ready: Visual

EXPLOSIVE COMPOSITION

Type: INA
Weight: 20

FUZE/SENSOR

Types: Dual, acoustic, and IR
Number of Fuze Wells: INA
Resistant to Explosive Neutralization: Yes

PERFORMANCE

Armor Penetration (mm): 6 @ 50 m or 2 @ 150 m
Effect: Directed fragmentation
Effective Range (m): 150
Target Speed (km/h): 250
Emplacement Method: Manual
Controllable (remotely detonated): Yes
Antihandling Device: Yes
Self-Destruct: INA

VARIANTS
None

NOTES
The HELKIR antihelicopter mine is designed to engage nap-of-the-earth targets. The sensor is a dual acoustic-IR. The acoustic sensor listens for a valid noise input and turns on the IR sensor. The IR sensor is located coaxially to the warhead. When a hot IR signature is detected, the warhead is functioned.